

WHAT IS CLAIMED IS

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1. A handover control method that switches a radio base station serving as a communicating counterpart of a mobile station comprising:

10 detecting whether any of mobile stations communicating with the radio base station become incapable of communicating while a predetermined minimum bandwidth secured; and

15 switching the communicating counterpart of the mobile station that communicates with said radio base station from said radio base station to another radio base station.

2. A handover control method that switches the radio base station serving as the communicating counterpart of the mobile station, comprising:

20 detecting whether any of mobile stations communicating with the radio base station become incapable of communicating while the predetermined minimum bandwidth secured; and

25 switching the communicating counterpart of the mobile station that communicates with said radio base station from said radio base station to a plurality of other radio base stations.

30 3. The handover control method as claimed in claim 1 or 2, wherein

35 a radio base station whose electric field intensity was the strongest and a mobile station that measured it are selected as the mobile station as the object of the handover and the radio base station serving as the communicating counterpart thereof, excepting a set of the mobile station and

the radio base station under current communication, based on electric field intensity information about the radio base stations obtained from each mobile station.

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4. The handover control method as claimed in claim 1 or 2, wherein

a mobile station to which allocation of radio resources is the nearest to the minimum bandwidth and a radio base station which has the most radio resources available are selected as the mobile station and the radio base station for the handover object.

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5. The handover control method as claimed in claim 1 or 2, wherein

a mobile station that requires the radio resources in the highest value of the minimum bandwidth and a radio base station in which the radio resources are available the most are selected as the mobile station and the radio base station for the handover object.

25 6. The handover control methods as claimed in any one of claims 1 through 5, wherein

the detection of an inability to communicate while the predetermined minimum bandwidth secured at any of mobile stations that communicate with the radio base station is realized by measuring an electric field intensity, a bit error rate, a frame error rate, a packet error rate, a packet discarding rate, or any combination thereof and basing on the measuring result thereof.

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7. The handover control methods as claimed in any one of claims 1 through 6, wherein

said mobile station selects a radio base

claimed in any one of claims 10 through 16, wherein
the process for selecting a combination of
any of mobile stations that communicate with said
radio base station and one or more radio base
5 stations that can communicate with said mobile
station is performed by a node that is connected to
each radio base station via a wired section.

18. The handover control methods as
10 claimed in any one of claims 10 through 16, wherein
a mobile station that communicates with
said radio base station performs the process for
selecting a combination of said mobile station and
one or more radio base stations with which said
15 mobile station can communicate according to said
predetermined standard.

19. The handover control method as claimed
in claim 18, wherein
20 said mobile station which communicates
with said radio base station determines whether said
radio base station is in a traffic congestion
condition.

20. The handover control methods as
25 claimed in any one of claims 1 through 19, wherein
the communication conditions between the
mobile station and one or more radio base stations
are supervised after switching the communicating
30 counterpart of said mobile station to said one or
more radio base stations; and
a process is performed such that the
communicating counterpart of said mobile station may
be switched again when the supervised communication
35 condition turned into a condition poorer than the
predetermined standard condition.

21. The handover control method as claimed
in claim 20, wherein

an error rate in communication between a
mobile station and one or more radio base stations
5 is supervised as said communication condition.

22. A handover system that switches radio
base stations as the communicating counterpart of a
mobile station, comprising:

10 detection means for detecting an inability
of any of mobile stations that are communicating
with a radio base station to communicate while a
predetermined minimum bandwidth condition secured;
and

15 switching control means for switching the
communicating counterpart of the mobile station
communicating with said radio base station from said
radio base station to another base station when said
detection means detected that any mobile station is
20 unable to communicate while the predetermined
minimum bandwidth condition secured.

23. A handover control system that
switches radio base stations as the communicating
25 counterpart of a mobile station, comprising:

detection means for detecting an inability
of any of mobile stations that are communicating
with a radio base station to communicate while a
predetermined minimum bandwidth condition secured;
30 and

switching control means for switching the
communicating counterpart of the mobile station
communicating with said radio base station from said
radio base station to a plurality of other base
35 stations when said detection means detected that any
mobile station is unable to communicate while the
predetermined minimum bandwidth condition secured.

said handover control system comprising means that transfers information about radio resources of said mobile station from said first radio communication system to said second radio communication system upon protocol conversion when the communicating counterpart of the mobile station that communicates with said radio base station is switched to a radio base station in the second radio communication system that employs the second communication protocol by said switching control means when said detection means makes said detection.

31. In handover control systems that switch a radio base station which serves as communicating counterpart of a mobile station, comprising:

traffic congestion checking means for deciding whether communication of a radio base station will be in a traffic congestion condition;

selection means for selecting a combination of any mobile station that is communicating with said radio base station and one of a plurality of radio stations with which communication is possible with said mobile station in accordance with a predetermined standard when said traffic congestion checking means determines that the radio base station will be in a traffic congestion condition; and

switching control means for switching the communicating counterpart of the mobile station in the selected combination to one or more radio base stations in the combination.

32. The handover control system as claimed in claim 31, wherein

the predetermined standard for selecting a combination of said mobile station and radio base

station is defined based on the amount of available radio resources in the radio base station, or the amount of radio resources required.

5. 33. The handover control system as claimed in claim 31 or 32, wherein

the predetermined standard for selecting a combination of said mobile station and a radio base station is defined based upon the receiving electric field intensity in communication between mobile stations and radio base stations.

34. The handover control system as claimed in claim 31 or 33, wherein

15 the predetermined standard for selecting a
combination of said mobile station and a radio base
station is defined based upon the ratio of the
amount of radio resources permitted to the mobile
station to the amount of radio resources currently
20 used in fact.

35. The handover control system as claimed in any one of claims 31 through 34, wherein

the predetermined standard for selecting a combination of said mobile station and a radio base station is defined based upon the number of the radio base stations which should perform simultaneous communication after switching the communicating counterpart.

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36. The handover control system as claimed in any one of claims 31 through 35, wherein

the predetermined standard for selecting a combination of said mobile station and a radio base station is defined based upon whether the radio base station which is performing the current communication is included.

37. The handover control system as claimed
in any one of claims 31 through 36, wherein,

5 said selection means gives the priority
about the appropriateness of mutual communication to
combinations of each mobile station that
communicates with said radio base station and said
radio base station and one or more adjacent radio
base stations; and
10 a combination of a mobile station and a
radio base station which is given with the highest
priority is selected.

38. The handover control system as claimed
15 in any one of claims 31 through 37, wherein
said selection means is provided in a node
connected to each radio base station via a wired
section.

20 39. The handover control system as claimed
in any one of claims 31 through 37, wherein
a mobile station which communicates with
said radio base station selects a combination of
said mobile station and one or more radio base
25 stations with which communication is possible in
accordance with said predetermined standard.

40. The handover control system as claimed
in claim 39, wherein
30 said mobile station that communicates with
said radio base station comprises said traffic
congestion detection means.

41. The handover control system as claimed
35 in any one of claims 22 through 40, comprising:
communication condition supervision means
for supervising the communication condition between

the mobile station and one or more radio base stations after switching the communicating counterpart of said mobile station to said one or more radio base stations;

5 condition decision means for deciding whether the communication condition supervised by said communication condition supervision means will be in a condition poorer than the predetermined standard condition; and

10 re-switching control means for performing process for switching the communicating counterpart of said mobile station again when said condition decision means determines that the communication condition as supervised is in a condition poorer
15 than the predetermined standard condition.

42. The handover control system as claimed in claim 41, wherein

20 said communication condition supervising means comprises error rate detection means for supervising an error rate in communication between a mobile station and one or more radio base stations as said communication condition.